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ABSTRACT

Effective teaching was the focus of a great deal of research during the 1970s. Many relationships between how teachers teach and what students learn were identified. Findings emerged from studies using a wide variety of methodologies. Thus far, findings from the research on teaching have been used primarily to improve the instruction of inservice teachers. However, the spotlight for educational improvement in the 1980s is on preservice teacher education. The 1982 Conference on Research on Teaching, upon which this paper is based, produced a synthesis of salient research findings from schools and classrooms. This paper considers the implications of the research on teaching to the curriculum and instruction of preservice teacher education. The effective school findings are considered first, followed by the descriptive and statistical findings on classroom organization and management, instruction, and teacher expectations. A section on collaborative research describes a process rather than findings per se. Included in each section are suggestions of how these research findings might be incorporated into preservice programs. The final section discusses some of the problems and challenges confronting those who are responsible for preparing new teachers. (JMK)

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Implications from The Research on Teaching for Teacher Preparation

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Effective teaching was the focus of a great deal of research during the 1970s. This effort was reasonably rewarding. Many relationships between how teachers teach and what students learn were identified. The findings emerged from studies using a wide variety of methodologies. The question for this paper to consider is "What are the implications of those findings for teacher preparation?" In summarizing the papers prepared for the 1982 Conference on Research on Teaching held at Airlie House, Virginia, Gage (1982) says that findings from the research on teaching range along a continuum of strength.

> At the weakest extreme is what we might call a *shred*—a weak relationship based on a small sample or an ethnographer's glimmer of insight. Next is a *suggestion* that something mildly good will happen if teachers behave in a certain way. A *recommendation* follows from convincing evidence—a strong relationship or an educational connoisseur's ineluctable conviction. An *imperative* consists of a powerful recommendation—a moral cry for action. And finally, a *categorical imperative* is a moral law that is absolute and universally binding.

Needless to say, there are few findings in the latter category. Gage goes on to say, "Implications for practice need to be considered carefully. Large effect sizes do not necessarily have important implications. Small effect sizes may amount to more than shreds or suggestions. Perhaps, if we think about them wisely, they can support recommendations or even imperatives."

In order to know whether research findings are useful in the classroom, the findings must be translated into workable teacher training programs. Using research based curriculums, several training experiments have been conducted (Anderson, Evertson, & Brophy, 1979; Crawford et al., 1978; Good & Grouws, 1979; Stallings, Needels, & Stayrook, 1979). The training treatment teachers received in these experiments ranged from a detailed list of recommendations to a series of seven 2-1/2 hour training sessions with observation and feedback to guide and encourage continued teacher change. No-

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tably, in all of the experiments, teachers changed their behavior and student achievement was significantly affected. The results of these several experiments are reported by Gage and Giaconia (1981).

Thus far, findings from the research on teaching have been used primarily to improve the instruction of inservice teachers. In the 1970s, comprehensive inservice training programs were financed by local, state, and national education agencies. An estimated $2000 per year per teacher was spent on inservice training during that period. This included the cost of programs such as Teacher Corps, Follow Through, Head Start, the staff development components of migrant education, bilingual education, special education, etc. Social changes required this massive effort to retrain teachers to help them work with mainstreamed handicapped students, multicultured student groups, recent immigrants, and low achieving students. The avenue for educational improvement was considered by educators and funding agents to be through the schools rather than through colleges preparing new teachers. The primary reason for this was that very few new teachers were being hired; fewer children were in schools and tenured teachers were staying in their jobs longer.

However, time passes, children grow up and produce more children, and tenured teachers grow older. According to the National Center for Educational Statistics, by 1985 we will need 689,000 new teachers, and 983,000 by 1990. This need will be created by the children of the baby boom children entering schools in the 1980s and the retirement of the many teachers who entered the work force in the 1950s to teach the baby boom children. The need to prepare new science and math teachers is particularly critical, for business and industry have been luring these teachers away from the schools.

The spotlight for educational improvement in the 1980s is on preservice education. The task of preparing a whole new cadre of teachers is a wonderfully challenging opportunity. Old and well worn curriculums must be examined in light of the knowledge and skills beginning teachers need to provide effective instruction in schools today. The 1982 Conference on Research on Teaching, upon which this paper is based, produced a synthesis of the most salient findings from schools and classrooms to that time.

As previously stated, the purpose of this paper is to consider the implications of the research on teaching to the curriculum and instruction of preservice education. Since teaching occurs within a school, the effective school findings are considered first in this paper. These are followed by the descriptive and statistical findings on classroom organization and management, instruction, and teacher expectations. A section on collaborative research describes a process rather than findings per se. Embedded in each section are suggestions of how these research findings might be incorporated into preservice programs. The final section considers some of the problems and challenges confronting those who are responsible for preparing new teachers.

The School Community

Schools have been defined as "loosely coupled systems in which the work of the teacher is largely independent of the principal's immediate supervision" (Purkey & Smith, 1982). While it may be generally true that teachers are sovereign in their own classrooms, they do operate within schools and are subject to policies and practices that may limit or enhance what happens in the classroom. For example, if policies regarding cuts and tardiness are clear and well enforced, students are in class more often; if there are few interruptions from the intercom or from students leaving the class for special activities, there is more time to provide instruction; if the discipline policy is clear, students behave better in class (Stallings & Mohlman, 1981; Glenn, 1981).

In academically effective schools, Purkey and Smith (1982) report a greater degree of (1) collaborative planning and collegial relationships, (2) sense of community (parents, teachers, and students), (3) clear goals and high expectations commonly shared, and (4) order and discipline. The leadership of the principal is a primary factor in effective schools.

Given these conditions, if a new teacher is lucky enough to be hired into an effective school, he/she may be expected to participate in decision making. Thus, some experience in collaborative planning and shared decision making would be helpful. This could be accomplished during teacher preparation through simulated staff meetings at which program decisions are made. Discussions with local school principals regarding how school policies are formed could acquaint the preservice teacher with school issues and a range of administrative leadership styles.

How school policies are made ranges from collaboration among teachers, parents, students, and administrators to top-down orders issued by the principals. The principal's leadership style may be supportive, guiding and collaborative, or very directive depending upon the situation. It would be helpful for preservice teachers to be aware of and thus prepared for a variety of leadership styles. Very clear rules for teachers, e.g., checking in, attending meetings, being on time, being available 30 minutes after school, can be helpful to a new teacher. The point is that preservice education should prepare teachers for several eventualities. (See Gates, Blanchard, & Hersey, 1976.)

In fact, leadership may not always come from the principal. Leadership sometimes comes from a few influential teachers with energy and vision (Berman & McLaughlin, 1976). Such teachers may initiate policy and/or control policy. The preservice teacher needs to be able to recognize these power groups and consider how to function through them.

Teacher unions or associations are other sources of power that affect the school community (Purkey & Smith, 1982). The preservice curriculum should include how unions or associations operate, how to influence them, and the options available. It would be informative to have a union or association representative discuss selected issues with preservice teachers.

Another influential sector of the school community is parents. Parent

expectations and participation will differ by region, school size, grade level, and socioeconomic and ethnic background. It is of utmost importance that new teachers establish good rapport with parents and listen to their expectations. Without careful consideration, teachers may depend upon stereotypes of cultural groups and establish negative self-fulfilling prophecies for some groups of students (Hamilton, 1983).

Satisfied parents can be a great source of help and support (Purkey & Smith, 1982). Dissatisfied parents can hinder and hurt. The preservice curriculum should offer opportunities to observe a master teacher conducting parent conferences, meetings, and home visits. Parents can be helpful in increasing students' learning time. Duval County, Florida, has developed useful materials for parents to use with their children. The focus is toward helping children learn to learn at home. This county has been successful in raising student achievement through school and home cooperation. There is a unanimity of purpose and practice between home and school (Sang, 1982).

Attributes of Effective Classrooms

The preservice curriculum needs to be coordinated so that classrooms are considered total environments to be affected by teacher decisions. Physical things such as space, furniture, materials, curriculum, and time may be determined by others, but how they are used is determined by the teacher. The participants are also fixed, but the activities offered and the interactions that occur are determined by the teacher. Green and Smith (1982) make a convincing argument that teachers provide academic content and structure for student participation simultaneously; content and process are interactive. However, the total classroom environment is so complex that researchers have tended to study small pieces of that very large puzzle. The first piece in that puzzle to be considered here is space.

Space

Space and how it is used is important. In effective classrooms, Arlin (1979) reports that space is:

> divided into distinct areas furnished and equipped for specific activities. Equipment that must be stored can be removed and replaced easily, and each item has its own place. Traffic patterns facilitate movement around the room, and minimize crowding or bumping. Transitions between activities are accomplished efficiently following a brief signal or a few directions from the teacher, and the students seem to know where they are supposed to be, what they are supposed to be doing, and what equipment they will need.

Nash (1981) reports that preplanning of classroom space can maximize student use of materials and participation in activities. Preservice curriculum should provide the opportunity for potential teachers to arrange doll sized furniture in simulated classrooms of different sizes with 20 to 40 students. This would provide the experience of organizing a classroom and considering the issues Brophy mentions.

Use of Time

There is considerable research on the use of time in schools. Research in the 1970s indicates that more time is not necessarily better. A longer school day can simply mean longer lunch and recess periods (Harnischfeger & Wiley, 1978). Stallings' work in elementary and secondary schools did not indicate greater student achievement in longer school days or class periods. How the available time was used was the important factor (Stallings, 1975; Stallings, Needels, & Stayrook, 1979).

Fisher et al. (1978) report that on the average, children in California spent six hours in school a day. Of that time, only two to four hours were spent in instruction. Within that instructional time, students were engaged from 1.5 to 3.5. hours, and of the engaged time for the total school day, students were involved with appropriate materials only 36 minutes to 90 minutes. Preservice teachers should be made aware of these findings and consider how easy it is to waste those golden minutes.

Knowing that time should not be wasted does not provide much guidance for the beginning teacher. More specific information is needed regarding how effective teachers use their time. To this end Stallings and Mohlman (1981) assimilated four data sets from secondary schools and identified how effective teachers distributed their time across activities. They found that effective teachers spent 15 percent or less time in organizing or management tasks, 50 percent or more time in interactive instruction, and 35 percent or less time in monitoring seatwork (see Table 1). Effective teachers used some time to work with the total group, small groups, and individuals. While this distribution of time would not be appropriate for all grade levels or times of year, it is a framework that can help preservice teachers think about the use of available time.

Lesson Plans

Decisions about the use of time should be made through a careful daily, weekly, and long range plan. Shavelson (1983, p. 403) referring to Yinger's work (1977) reports the following pattern of teacher planning.

1. *Long range*—yearly planning for academic subjects.
2. *Term*—planning for academic subjects and certain materials.
3. *Monthly*—planning for basic academic units and necessary materials.
4. *Weekly*—planning for specific units and time allocation.
5. *Daily*—planning.

(Yinger, 1977, p. 172)

Specific skills are needed to prepare a daily and weekly plan. Madeline Hunter's widely used Instructional Skills Program offers a detailed five-step lesson plan. Many school districts and state departments of education are disseminating Hunter's strategies. Even though there is not solid evidence of the effectiveness of the program, a preservice curriculum should include exposure to the five-step lesson plan. A study is in progress to evaluate the relationship between teacher implementation of the Instructional Skills Pro-

gram and student engaged rate and achievement (Stallings, Robbins, & Wolfe, 1983).

Long-range plans are also important. According to Joyce (1979), p. 75):

> Most of the important preactive decisions by teachers are long-term in their influence as opposed to the influence of lesson by lesson planning. Relatively early in the year, most teachers set up a series of conditions which were to be powerfully influential on the possibilities of decision making thereafter. Lesson planning, to the extent that it goes on consciously, involves the selection and handling of materials and activities within the framework that has been set up by the long-term decisions.

TABLE 1
TIME ALLOCATIONS

Organizing/Management Activities (15% or less)
- (E) Take Roll
- (E) Make Announcements
- (E) Pass Materials
- (E) Make Expectations *Clear* for the Period: Quality and Quantity of Work
- (S) Organize Groups
- (E) Clarify and Enforce Behavior Expectations

15% Non Academic

Interactive Instructional Activities (50% or more)
- (E) Review/Discuss Previous Work
- (E) Inform/Instruct New Concept Demonstrate/Give Examples Link to Prior Knowledge
- (E) Quesiton/Check for Understanding
- (S) Reteach Small Group (if necessary)
- (S) Oral Drill and Practice
- (E) Summarize

85% Academic

Teacher Monitoring/Guiding Seatwork (35% or less)
- (I) Written Work
- (I) Silent Reading

KEY	
E	*Total Class*
S	*Small Group*
L	*Large Group*
I	*Individual*

In spite of best laid plans, the lesson may not go that way. Research by linguists indicates that while a teacher may plan a lesson, the lesson itself is modified as the teacher and students interact with the materials and activities (Green & Smith, 1982). In summarizing several studies on planning, Shavelson (1982) suggests that prolific planning may be counter-productive if the teachers become single minded and do not adapt their lessons to student

needs. Thus the preservice curriculum should incorporate strategies for planning lessons and develop an awareness for when and how to alter plans.

Classroom Organization and Management

There is no doubt that students in classrooms that are well managed perform better on achievement tests (Brophy, 1979; Fisher et al., 1980; Good, 1979; Rosenshine & Berliner, 1978). "Because successful classroom managers maximize the time their students spend engaged in academic activities, their students have more opportunities to learn and this shows up in superior performance on achievement tests" (Brophy, 1982). However, knowing this fact will not help the preservice teacher know how to do it. Observations by researchers Evertson, Anderson, and Emmer in both elementary and junior high schools (1980) were so specific that practice can be guided by them even for the first days of school. These researchers describe in detail how effective teachers established and carried out their management plans, and subsequently developed a set of checklists for teacher use. Preservice teachers should have the benefit of reviewing these materials.

Grouping is a part of classroom organization. Children are grouped within classrooms for several purposes. Traditionally, students were placed in ability groups (high, medium, and low) so that teachers could provide instruction that was appropriate to the approximate achievement levels of the children. This practice has raised serious controversy regarding children's self-images, motivation, and perceptions. Linguistic studies summarized by Green and Smith (1982) indicate that students in low groups have different input in terms of content, strategies for reading, and definitions of reading. Lessons for low groups consistently placed greater emphasis on pronunciation, grammar errors, and single word decoding. The high groups were encouraged to "go for the meaning;" their pronunciation and grammar errors were often ignored. Weinstein (1982) describes how children perceive the teachers' relationship to high and low achieving students. Students described as low achievers received more negative feedback and teacher direction, and more work and rule orientation than high achievers. High achievers were perceived as receiving higher expectations, more opportunity and choice than low achievers. No differences were documented in the perceived degree of supportive help. Unfortunately, we do not know the achievement effects upon the high and low achieving students who received differential treatment.

There is research from studies of reading and math that indicates ability grouping has a positive effect upon achievement. The Direct Instruction Follow Through Program (Becker, 1977) has consistently had a positive effect upon children within reading and math ability groups. This program does, however, allow for children to change from one group to another as their progress warrants. The National Follow Through Study also found a positive effect from ability grouping. Low achieving students profited in math from a longer period of study more than did high achieving students (Stallings, 1975).

When and how teachers work with each group is important. Work in

progress indicates that it is more effective to work with the medium achievement reading group first, the low group second, and the high group last. In this manner, the lowest group, who are likely to have the shortest attention span, do not have as long a time at the beginning or end of the period to work independently (Stallings, 1983).

During group work, effective teachers make clear when students can ask questions and of whom they can ask questions. They do not allow students to interrupt during focused small group instruction (Evertson et al., 1981). However, Green and Smith (1982) report that this signaling of what is acceptable and what is not is a complex process. If teachers do not respond to students' requests for help as needed, the student has several alternatives: the student can (1) attempt to overcome the problem or make a decision on his/her own, (2) ask another student for help, (3) switch to an alternative activity, or (4) approach the teacher anyway. Each decision carries a different outcome for the student. Instruction for preservice teachers should help make them aware of these student options and have strategies to assist students to stay on task until help can be offered.

Groupings are also used for cooperative learning and to establish good interpersonal relationships and group dynamics in the classroom. Several researchers have developed methods to bring about student cooperation (Aronson et al., 1978; Slavin, 1980). They have developed a variety of activities in which students of different achievement levels form groups that have a task to complete requiring the participation of all students. In one approach, each member of the group possesses at least one key item of unique information which is essential to the group's success. The problem encountered encourages everyone to participate. In some cooperative approaches, participants receive a group score rather than an individual score. The group score could be based upon the gain made by each participant. Such procedures motivate the high, medium, and low achieving students to cooperate and achieve.

It is important to note that children are not likely to know how to work in groups productively unless some training is provided. Wilcox (1972) found that students trained to lead groups by encouraging all to participate and being certain that everyone had a turn were better at solving specific problems than were untrained or leaderless groups. The trained student leader groups were also better group problem solvers than were classroom teachers, who tended to do all the problem solving themselves. It is important that preservice teachers be exposed to the cooperative group learning research since it offers an alternative to competitive and rote learning.

Disruptive Student Behavior

The findings on disruptive behavior are very clear in all of our studies. In classrooms where students evidence more misbehavior, less time is spent on task and less achievement gain is made by students. There are many techniques effective teachers use to manage student behavior. The first days of school study by Evertson, Anderson, and Emmer (1980) yielded some

specific recommendations: define rules and penalties before school starts (coordinate with school rules), teach rules and procedures to students during the first days of school, consistently monitor and reinforce rules, reward acceptable behavior and punish misbehavior.

There are some behavior management programs such as the Assertive Discipline Training Program (Cantor) and the Classroom Management Training Program (Jones) which bring peer pressure to bear upon individuals. These programs offer rewards for good behavior (special games, activities, script, recognition) and withdraw privileges for bad behavior. These programs are effective in stopping the behavior, but they do not necessarily solve the problem.

Problems of an interpersonal nature need to be solved. Glasser's *Schools Without Failure* (1969) offers group problem solving methods and techniques to help students develop responsibility for their own behavior. Brophy (1982) summarizes the ten steps of this process (p. 35-36). While there is little systematic research on the Glasser program, survey data (1977) indicate fewer referrals to the office, fighting, or suspensions among students in classes implementing this program.

The preservice curriculum should include several approaches to controlling disruptive behavior. Of the several hundred teachers with whom I have worked and the student teachers interviewed in the last several months, there is solid agreement that most lacking in their preparation for teaching were techniques for managing classroom behavior.

Instruction

Now that the stage is set—furniture and materials placed, lessons planned, and strategies ready for dealing with disruptive behavior—instruction is about to begin. Instruction can and should follow several formats determined by the participants, subject matter, and objectives of the lesson. There are no panaceas.

Three aspects of learning have yielded useful implications for classroom teaching: these are (1) memory, (2) understanding, and (3) reasoning or problem solving. All three of these functions are necessary for students to process and use information.

Memory. Memory skills are essential for lower elementary students to succeed in basic reading, writing, and computation. Ample research in the 1970s indicates that a very structured, carefully sequenced approach is effective in developing memory skills/basic skills. Rosenshine (1982) in summarizing this literature says:

> In general, to the extent that students are younger, slower, and/or have little prior background, teachers are most effective when they:

- structure the learning experience
- proceed in small steps but at a rapid pace
- give detailed and more redundant instructions and explanations

- have a high frequency of questions and overt, active practice
- provide feedback and corrections, particularly in the initial stages of learning new material
- have a success rate of 80% or higher in initial learning
- divide seatwork assignments into smaller segments or devise ways to provide frequent monitoring
- provide for continued student practice (overlearning) so that they have a success rate of 90-100%

The interactions are started by the teacher presenting a small bit of information, asking a question, and calling for an individual or group response. Praise is offered if the answer is correct and correction is given if the response is incorrect (Anderson, Evertson, & Brophy, 1979).

Research of the past few years shows that most students can, through sufficient drill and practice, memorize most facts that are important for them to have available through immediate recall. The curriculum for preservice teachers should include instructional practice in using quick paced interactions when children need to memorize material.

Understanding. In addition to facilitating students' memorization of facts, instruction should also develop students' understanding of the lesson content. Cognitive psychologists have studied linkages between new information and prior knowledge. Teachers need to help students make these linkages. Every student walks into the classroom with some experiences and knowledge, but this experience differs widely, especially among children from varied socioeconomic and ethnic backgrounds. This is one reason why it is important for teachers to understand the children's culture. How the teacher structures the new information makes a difference in what students will be able to link to their existing information. Calfee (1981) describes the mind as a filing system where there are hooks or pegs on which to hang information. This filing system is essentially the long-term memory from which the information can be retrieved and used in other situations.

For information to be filed, it must first be noticed. Broadbent (1975) wrote that only some of the information presented will receive attention, and if this selection is not decided deliberately, it will certainly be decided by chance factors. If something is not noticed at the time it happens, it has hardly any chance of affecting long term memory (or the filing system as Calfee describes it). It is the teacher's role to be certain that students have noticed the information and made a link with existing information, thus guaranteeing storage in long-term memory.

The importance of teachers' checking for understanding was shown in a study conducted by Webb (1980). In a group problem solving task, those students who received an explanation after making an error solved the problem correctly on another trial. The explanation did not have to be directed toward the student, but could have been directed toward another student within the same group. Those students who never received explanations after an error were not able to solve the problem on the second trial.

Some educational programs, such as Madeline Hunter's Instructional Skills, include a step that requires teachers to check for student understanding before proceeding with instruction. If students do not understand, the teacher restructures the task and provides different examples and experiences to build the required background knowledge. The effects of this model are being tested (Stallings, Robbins, & Wolfe, 1983).

While the theory on student understanding and the need for linkage is strong, the research findings are meager to date. The studies tend to have small samples, and experiments that teach teachers to use strategies that will increase understanding and lead to testable student outcomes are generally lacking. More studies such as Webb's are needed. Nevertheless, it is important to include this research in the preservice curriculum even if it is still a twinkle in the researcher's eye.

Problem Solving/Reasoning. The need to train students in problem-solving or reasoning skills has been receiving increasing attention, both from the educational system and from industry. In a recent survey of electronics firms in California's Silicon Valley, business leaders were asked to identify the skills most lacking in their recently hired employees, and which skills the educational system should help students to develop to become effective employees. The majority of the respondents reported that the schools should help students develop problem solving skills, for such skills were needed by employees at all levels (Needels, 1982). The respondents reported that at the present, many of their recently hired employees, whether high school or college graduates, were deficient in that cognitive area.

G. H. Hanford, President of the College Board, notes that, "The decade-long decline in test scores appears largely due to the fact that reasoning ability in secondary schools is not what it used to be. In recent years, students in lower grades show marked improvement in reading, writing, and other basic skills, but students fall behind when problems get more complex." The College Board is currently funding a study to identify ways reasoning and problem solving can be taught (1983).

One of the difficulties in studying problem solving has been the lack of group administered tests that can examine the thinking skills of young children. The tests usually require individual administration and this prohibits large scale studies. Another problem is in identifying and measuring the classroom teaching skills expected to be related to gain in thinking skills. One anomaly is a study of 52 Follow Through classrooms (Stallings, 1975) which reports the relationship between scores on a group administered test of nonverbal problem solving skills and teaching behaviors. These findings indicate that student scores were higher on that test in classrooms where the structure allowed students to take more initiative. In such classrooms, students asked more questions, worked more independently with manipulative materials, and worked more often on group tasks in cooperative activities. Teachers asked more thought-provoking questions and provided less overt praise and

correction. The lessons were not quick paced such as those used to develop memory skills.

Inquiry methods are expected to develop problem solving skills. Collins and Stevens (1982) identified instructional strategies used by expert teachers who use inquiry methods effectively. The authors identified five strategies: (1) systematic variation of examples, (2) counter examples, (3) entrapment strategies, (4) hypothesis identification strategies, and (5) hypothesis evaluation strategies. Even though the teachers observed by Collins and Stevens taught different content areas, the authors reported that these strategies were consistently used by all the teachers, thus the strategies most likely are not domain specific but can be applied to different content domains.

Preservice teachers need to be trained to think of the psychological processes and structures which the student must develop to produce the desired behavioral objectives. Any one lesson could require drill and practice, checks for understanding, and problem solving. It is the instructional repertoire that teachers need, and the knowledge of which strategy is likely to develop memory, understanding, or reasoning. The important thing is that preservice teachers do not embrace extreme or singular points of view. Broadbent (1975), in speaking of extremes, says that:

> life certain strategies of encoding the outside world, of organizing memory, and of proceeding from one step in an operation to the next, and that these may be highly general in their later use. The successful teacher, of course, has always known this, but in standing out for the middle ground between mechanical drill on the one hand and the abandonment of all positive teaching on the other, he/she can now claim the support of contemporary cognitive psychology (p. 175).

Teacher Judgment and Expectations

All teachers make judgments about students' abilities and develop a set expectations which guide the curriculums they offer and the instructional strategies they use. Teacher judgments of student achievement are based upon student reputations and observations of classroom behavior, work habits, products, classroom participation, and test scores. Although these judgments are fairly accurate, they tend to impact upon expectations for low achieving students in a self-fulfilling way.

In a summary of studies on teacher expectations, Brophy and Good (1974) indicate that students for whom teachers held low expectations were treated less well than other students. They tended to be seated farther away from the teacher. They received less eye contact and were smiled at less often. They received less instruction, had fewer opportunities to learn new materials, and were asked to do less work. Teachers called on these students less often and tended to ask them simple rote answer questions. They were given less time to respond and fewer guides or probing questions when their answers were wrong. They remained low achieving students.

In an effort to change teacher and student perceptions of low achieving students, Morine-Dershimer (1983) trained a group of teachers to ask higher level questions of low achieving students. The questions elicited ideas, hunches, opinions. When students in the class were asked to check the names on a list of these who made good contributions to the class discussion, low achieving students' names were checked. In classrooms where teachers asked low achieving students simple questions, these students were not rated as making contributions. This point is important. If teachers do not expect that students can take part in a higher level discussion, these students are not even given a chance. In the case of high achieving students, high achievement is reinforced, and similarly, low achieving students' low achievement is reinforced.

When asked to list the outstanding qualities of the best teacher they ever had, a national sample of school administrators, teachers, and parents most often mentioned high expectations. Audience responses included, "He challenged me." She made me think I could do it." "He thought I could, so I did." She always made me stretch a little bit higher." "He never let me off the hook.

Based upon clinical and mildly good empirical evidence, there are implications that teacher judgments and expectations do impact upon student learning in terms of what is offered to students and how students perceive each other. According to Gage's continuum of importance (1982), it seems "imperative" that the teacher preparation curriculum include exposure to the teacher judgment and expectation literature.

Collaborative Research

In order to continue to learn about effective instruction, the preservice teacher needs the opportunity to develop research skills. The teacher preparation courses should provide opportunities for students to develop questions which can be examined through naturalistic recordings, structured observations, criterion tests, surveys, or interviews.

The importance of research skills is exemplified by a project in San Diego conducted by Tikunoff, Ward, and Griffin (1979). The framework of this project required teachers at one school to select one pressing problem to study in depth. After several brainstorming sessions, the teachers decided to study classroom interruptions. With the assistance of the researchers, they developed methods to record the nature, purpose, and length of interruptions. The researchers helped the teachers process these data and write the results in a manner that could guide school practice. The beauty of this project is that teachers selected their most pressing problems and developed solutions.

During the project, the teachers were guided to read some of the research on teaching literature. Although classroom teachers expected it to be formidable, with a little help they did interpret and discuss the implications of the findings. Most classroom teachers do not have this opportunity and research studies remain formidable. It is the responsibility of preservice education to expose students to research terminology and possible flaws in re-

search designs. They may be pressed to conduct their own studies on the issues that matter to them.

Implications, Problems, and Solutions

Many recommendations have been made for inclusion of research findings in the teacher preparation curriculum. At this point, teacher educators may be considering all of the constraints placed by state legislatures or firmly entrenched programs. While state required course titles may be problematic, might it be possible to change the content and focus of the course while keeping the name? Most likely the process for teaching the courses could be changed without upsetting the system. It is this author's contention that the process of teaching teachers must become much more participatory.

In the freshman year, why not require education students to learn to use a simple well-focused observation instrument. For example, have them record in a real school classroom who the teacher speaks to and the nature of the interaction. (See the Attachment for simple seating chart observations.) Next, have the student discuss what they saw and contrast that with findings from research. There are some clearly written pieces free from jargon. (Anderson, Evertson, & Brophy, 1979, is one.) Each year, students should learn to use more complex observation systems and make naturalistic recordings. Let student teachers do peer observations and give each other feedback.

Incorporate the research on teaching into the methods courses and foundation classes. Within this structure students should be continually challenged to develop good questions about teaching and learning, to generate solutions, and to test ideas.

Another means to increase participation is to have the preservice teacher interact with school principals and teachers as they learn about the school community. Have a variety of excellent teachers and principals lead discussions and answer the preservice students' questions on a regular basis. The variety is important because there isn't a best style or solution to every situation. Good teaching is the matter of finding the right key to unlock knowledge for each student. A good locksmith has an assortment of keys and the expertise to know which key might fit. And so it is with teaching; a teacher needs a pocket full of keys and knowledge enough to make reasonable judgments about what will fit. The fortitude to keep trying is also necessary. While there is a knowledge base of good instruction, the teacher must also be a good learner. In this age of rapidly developing technology, even the graduates of 1983 will be left behind if they do not have learning skills and know how to use information.

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ATTACHMENT

TEACHER'S INTERACTIONS WITH STUDENTS SEATING CHART

This data is to be collected throughout the selected class period.

A simple way to collect information on the teacher's interaction patterns is to record on a seating chart each time the teacher speaks to an individual student. The coding can be as follows:

? = Teacher asks a student a direct question: "Johnny, what is the spelling of the word 'voyage'?

(?) = Teacher asks student an open-ended, thought-provoking question: "Ursula, what do you think will happen next in this story?"

I = Teacher checks for understanding: "Tell us in your words, Maria, what photo-synthesis means."

= Teacher makes a comment or response: "Flora, your hair looks nice today."

+ = Teacher praises or supports a response: "Very good, Jose, 'forty-two' is the correct answer."

C = Teacher corrects a students response: "No, Barbara, that is wrong."; or "The correct answer should have been 'Mark Twain'."

G = Teacher corrects *and guides* a response: "Janice, try spelling the word one letter at a time, according to how it sounds, and see if you can figure it out."

– = Teacher reprimands behavior: "Martin, be quiet!"

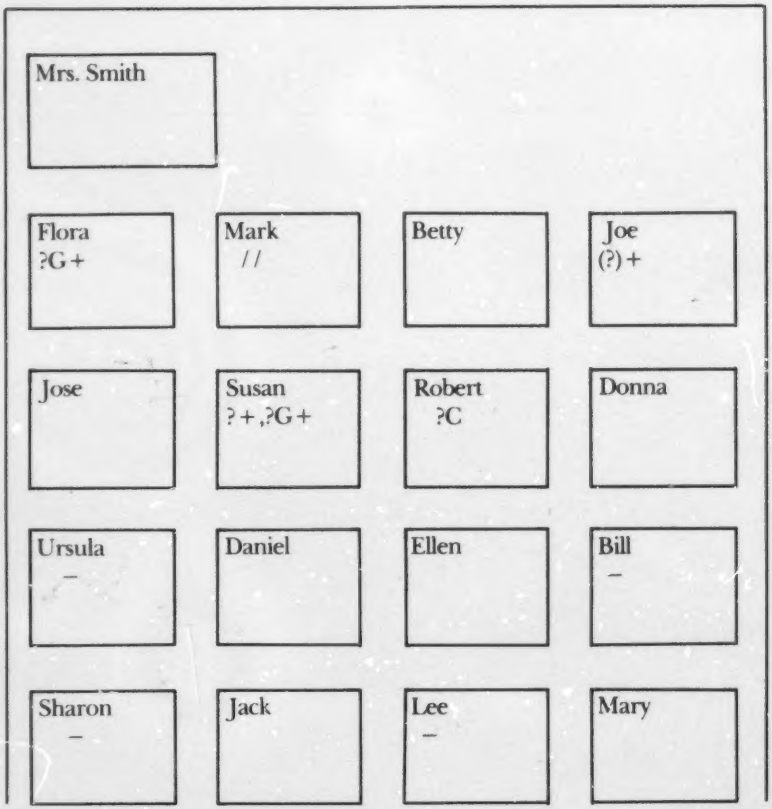
On the next page, we see an example where the teacher has asked Sue a direct question, praised, asked another question, guided, and praised.

These data can help teachers see to whom they are speaking and the nature of the interaction. It will also provide a frequence count of the questions asked, praise given, reprimands, and so forth.

NOTE: If the classroom seating takes a different form than the seating chart; for example, tables are arranged in a horseshoe formation instead of rows of desks; then the seating chart should be redrawn to conform to the actual classroom arrangement. The important thing is to get each student's name in the right place on the seating chart.

TEACHER'S INTERACTIONS WITH STUDENTS
SEATING CHART

DATE: _____ SCHOOL: _____



Instructions:

1. Fill in student's names in appropriate seats. Fill in the date.
2. Each time the teacher speaks to an individual student, record the appropriate code in the student's box.

Codes: ? = Asks a direct question
(?) = Asks an open-ended question
1 = Makes a comment or response
+ = Praises or supports a response
C = Corrects a response
G = Corrects and guides a response
– = Reprimands behavior

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